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Notes on Erebia rossii Curtis (Lepidoptera: Satyridae) [1]

BY PAUL R. EHRLICH, Lawrence, Kansas

Since the publication of his paper on *Erebia rossii* [2] the author has had the opportunity of examining the specimens of that species in the collection of the Carnegie Museum and of observing it in the field.

Of special interest at Carnegie was a long topotypical (paratype?) series of *E. rossii kuskoquima* Holland. These specimens were, on the whole, not as well marked as the sample examined by the author previously, tending more towards *gabrieli* dos Passos. Of three males from St. Michael, Alaska, in the collection, two were typical *kuskoquima*, the third closer to *gabrieli*. Three males from the mountains between 40 Mile and Mission Creeks, Alaska, were all close to *kuskoquima*. An interesting record was a single battered male, misidentified as *"Erebia mancinus,"* from "Cape Thompson, Arctic O(cean)." This locality is near the northwestern corner of Alaska, approx. 68° N., 166° W.

Unfortunately *E. r. gabrieli* was described when insufficient comparative material was available. It is possible that the name may prove applicable to the populations which exist in the mountains of northern British Columbia and the southern Yukon. It is more likely, however, that when the distributional patterns of *rossii* are well known, *gabrieli* will have to be relegated to the synonomy as merely representing a step in a cline.

[1] Contribution no. 878 from Department of Entomology, University of Kansas, Lawrence.

[2] Trans. Amer. Ent. Soc., 78:75–88, 1952.

Erebia rossii presents many interesting problems in distribution and subspeciation; problems which may well be solved now that the Arctic is being rapidly opened to scientific investigation. Such questions as whether the increasing forest in the Mackenzie Delta region will eventually prove to be an effective barrier to *rossii*, whether the Pas and Gillam records of *ornata* indicate that it is at least to some degree adapting itself to life in the taiga, and whether *rossii* populations in British Columbia and the Yukon are examples of relict endemism or of the "island hopping" type of dispersal, may be answered by ecological studies in critical areas.

Perhaps the most easily acceptable (but still extremely hypothetical) explanation of the present distribution of *rossii* would be that it has been dispersing, since the Wisconsinan, either from an Alaskan refugium or from Asia via the Bering Strait. The insect is now established over most of the North American tundra, with the exceptions of the northern part of the Arctic Archipelago (where the climate is probably too rigorous), Arctic Labrador and Quebec, and possibly Coats [3] and Mansel Islands in northern Hudson Bay. The single Labrador record of *rossii*,[4] if authentic, would indicate that it has gained a foothold in northern Labrador, having come over from southern Baffin Island.

During the summer of 1952 the author observed *rossii* in the field at Coral Harbour, Southampton Island, N.W.T. Although, because of pressing duties, it was not possible to make a detailed study of *rossii*, more than 60 individuals were collected and some cursory observations were made. The insects were common in the low, wet, *Carex* meadows between the ridges of high, dry tundra. They were most abundant in the larger meadows, especially in the lush vegetation around good sized lakes, but were also found in small marshy areas in the high tundra itself. The former habitat is shared principally with *Colias hecla* Lef.; the

[3] On July 24, 1952 the author collected briefly near Cape Southampton, Coats Island, in the type of locality in which *rossii* was common at Coral Harbour, Southampton Island, 150 miles to the north. A short series of *Colias hecla* Lef. was taken, but no *rossii* were seen.

[4] WILLIAMS, R. C., Ent. News, 42: 157, 1931.

latter, with several species of *Boloria*. It is to be expected that when the life history of *rossii* is completely worked out, its larvae will be found to feed only on a species or a group of species of sedge which is restricted to the large wet meadows. On the warmest, stillest, brightest days, male *rossii* flitted weakly over the meadows in the typical satyrid manner, not rising more than a foot or so above the tundra. The females' flight was even weaker, the individuals rarely rising more than a few inches above the *Carex*. When disturbed, the insects would rise higher into the air and allow themselves to be carried a hundred yards or more by the omnipresent breeze.

Because of its weak flight, prevailing winds cannot be discounted as a possible major guiding agency in the dispersal and subspeciation of *rossii*. It is not inconceivable that in certain areas prevailing winds may even restrict gene flow along a cline to one direction, allowing mutated genes with selective advantage appearing in the "downwind" end of a cline to build up there without spreading to the other end. All of this is, of course, highly theoretical, but should, the author feels, be investigated.

Insects Reared from Lepidoptera [1] (Hym., Dipt.)

By Ralph B. Priddy, University of Pittsburgh, Pittsburgh, Pennsylvania

The following records are based on rearing of material collected by the writer during the spring and summer of 1953 in western Pennsylvania. The writer is greatly indebted to H. K. Clench, C. F. W. Muesebeck, and C. W. Sabrosky for identifying most of the species involved.

On June 27, 1953, at Linesville, of six sphinx larvae feeding on horse gentian, *Triosteum* sp., three were large and nearly mature; the other three were very small but otherwise identical. All were placed in a rearing cage in the laboratory and fed leaves of *Triosteum*. The three large ones spun cocoons on July 1 and emerged, one on July 20 and two on July 21, as adult bumble-bee

[1] Contribution No. 10, Pymatuning Laboratory of Field Biology.

moths, *Haemorrhagia diffinis diffinis* Boisduval. The three small larvae of the same species proved to be retarded in growth due to parasitism. About July 1 were seen three light yellow, wooly cocoons formed by the parasites—one from each of the three small caterpillars. One of these cocoons was fastened to a *Triosteum* leaf directly under the shrunken body of the host larva. Another was found fastened to a leaf and the third to the net cover of the rearing cage; two of the caterpillars apparently had been able to crawl away after the parasites emerged from them. One was found dead several inches away.

The three parasite cocoons were placed in a plaster rearing chamber, and on July 4 and 6 the adults emerged by cutting a circular opening at one end of the cocoon. The one whose cocoon had been found under the body of its host emerged on the earlier date. These parasites were determined by C. F. W. Muesebeck as a species of *Apanteles* closely related to *agricola* Viereck (Hymenoptera, Braconidae), but apparently distinct and seemingly undescribed. Muesebeck notes further (*in litt.*) that this species is presumably the one recorded by Weed (Entomologica Americana, 4(8): 149, 1888) as *Apanteles limenitidis* Riley var., which was reared from the same host, but that it is really a distinct species, not a variety of *limenitidis*. No other records of parasites of *Haemorrhagia diffinis* or its races have been found by the writer.

On April 12, 1953, at South Park, Allegheny County, the writer collected several cases of the bagworm, *Thyridopteryx ephemeraeformis* Haworth, from twigs of chokecherry and kept them in a closed jar in the laboratory at room temperature. From some of these cases, on April 28 and 29, emerged five adult *Pseudogaurax anchora* (Lw.) (Diptera, Chloropidae). A much larger number of empty puparia was found in the cases, suggesting that most of the flies had emerged before the cases were collected. The latter also contained remains of chrysalis skins but no eggs of the bagworm, which should occur there at that season. It cannot be determined from these circumstances whether the larva of *P. anchora* is a predator of the eggs of the bagworm or merely a scavenger. The bagworm cases were

carefully examined and no indications of other insects were found in them, nor did any emerge later.

The larva of *P. anchora* has been described by some writers as parasitic or predatory on insect larvae and spider egg cases, and by others as feeding on dry chitinous material, including egg shells, cast larval skins, and chrysalis skins. It has not been recorded previously from the bagworm. Howard (U.S.D.A., Div. Ent., Bull. no. 5, Tech. Ser.: 44–45, 1897) listed *P. anchora* as a scavenger, stating that its larvae and puparia were found in old cocoons of *Hemerocampa leucostigma* S. and A., the larvae of which had been destroyed by *Iseropus coelebs* (Walsh). The *Pseudogaurax* larvae fed upon the dry remains of the caterpillar or were found in the dead pupae. The adults emerged in September, December, May, July, and August. Howard also cites Osten Sacken as finding *P. anchora* feeding gregariously upon the chrysalis of the cecropia moth, and Fernald as rearing it from the cocoons of the gypsy moth, *Porthetria dispar* (L.). Coquillett (U.S.D.A., Div. Ent., Bull. 10, n.s.: 70–72, 1898) reared this species from egg shells of *Corydalus cornutus* L. and noted that the larvae also fed upon larval exuviae and chrysalis skins of *Hemerocampa leucostigma;* in the latter case adult *Pseudogaurax* issued on April 9, 17, and 18, from cocoons collected the previous September. In 1908, Kahl reared a specimen (Carnegie Mus. Acc. No. 3748) which emerged July 27 from the cocoon of a promethea moth taken July 25 at Pittsburgh, Pennsylvania. Auten (Ann. Ent. Soc. Amer., 18: 244, 1925) reared *P. anchora* from nests of the spider *Epeira cornuta.* Kaston and Jenks (Bull. Brooklyn Ent. Soc., 32: 161–165, 1937) reared four specimens from an egg sac of *Argiope aurantia,* the orange garden spider. Breland (Jour. N. Y. Ent. Soc., 48: 259–261, 1940) found it occurring in cecropia cocoons collected at Brooklyn, New York, on November 11, 1937, and March 19 and December 15, 1938. The larvae of *P. anchora* occurred within all parts of the dried tissue of the cecropia. Many were themselves heavily parasitized (up to 10 in one puparium) by a small chalcidoid, *Pleurotropis* sp. Sabrosky (*in litt.*) states that *P. anchora* has also been reared from egg masses of various mantids, but not, to his recollection, from bagworm cases.

Trachys pygmaea (Fab.) the Hollyhock Leaf Miner in New Jersey (Col.: Buprestidae)

By Harry B. Weiss

The genus *Trachys* was first recorded in our fauna by E. Gorton Linsley in 1948. Between June 6 and June 18 of that year Dr. Linsley collected a series of *Trachys pygmaea* (Fab.) on hollyhock leaves in Rutherford, New Jersey, and recorded his findings about this species, which is indigenous to Europe, Asia Minor and North Africa, in the Journal of the New York Entomological Society, Vol. LVI, December, 1948, p. 251. My interest in this species was revived in March, 1954, when C. A. Frost of Framingham, Mass., advised me that he had received specimens from R. H. Jackson, labeled "Montclair, N. J., July, 1953," together with information that hollyhock leaves had been damaged by larval mines and adult feeding.

Mr. L. Donald DeBlois, who has charge of the economic insect survey work in New Jersey, was asked to determine the geographical distribution of the species in the State of New Jersey, and his crew of inspectors examined hollyhock plants at 105 locations, mostly in gardens, between June 23 and June 30, 1954. They found the species at 19 places, as follows: Bergen County—Fair Lawn, Ridgewood, Hackensack, Lyndhurst, East Rutherford; Passaic County—Hawthorne, Paterson, Passaic, Clifton; Union County—Cranford; Essex County—Bloomfield, Glen Ridge, Montclair, Verona, Orange, Newark, Nutley, Belleville, Irvington. Inspections made in Hudson, Middlesex, Monmouth, Morris, Somerset, Mercer, Burlington and Camden counties were negative. The species was found to be generally distributed in an area of about 270 square miles extending from Ridgewood in the north to Cranford in the south and from Hackensack in the east to Verona in the west. At nine of the 19 localities the species was fairly abundant, either as adults or as larvae in mines.

The species apparently overwinters in the adult stage, the beetles appearing in the latter part of May. Eggs are deposited

on the uppersides of hollyhock leaves (*Althæa rosea*), and each is covered with a shining, blackish, secretion which hardens into a flat circular or oval mass about 0.8 mm. long and 0.6 mm. wide with a slightly convex upper surface. Upon hatching, the larva starts mining at once and the dark secretion covering the egg remains on the leaf at the edge of the mine long after it is empty. At first the mine is circular but as the larva develops the mine becomes irregularly oval or blotch-like. Completed mines containing full grown larvae varied in size from 15 to 20 mm. long by 5 to 14 mm. wide.

During the last week of June, adults, pupae, and partly and full grown larvae were apparent. Some leaves contained from one to 25 mines varying in size from 3 mm. in diameter to completed mines containing pupae. Each mine is inhabited by a single larva and pupation occurs within the mine. In severe infestations the mines coalesce, involving most of the leaf; the entire mesophyll of the leaf is consumed leaving only the transparent upper and lower epidermis.

The full grown, legless, whitish larva, 5 mm. in length, is typically buprestid in shape, with retracted head, deeply lobed segments, with the abdominal ones becoming narrower posteriorly. The dorsal surface of the first thoracic segment is marked by a large, dark, subrectangular area. The dorsum of the second thoracic segment carries a smaller, similar dark area. The third thoracic and the first six abdominal segments are each marked dorsally with a dark, circular dot resting upon a dark, larger, oval area. The dark markings on the dorsal surfaces of the remaining abdominal segments are reductions and modifications of the others. The markings on the ventral body segments are similar in size and shape to those on the dorsal side. The pupa is about 4 mm. long and from a maximum width of 2 mm. it tapers anteriorly and posteriorly to a width of 1 mm. The larval markings show quite plainly through the transparent upper and lower leaf surfaces. The elytra of the adult are bright green or blue green, the head and pronotum brilliant cupreous, the ventral surface black with a cupreous lustre. The adults resemble Pachyschelus in shape and size.

Professor E. Martin Hering in his "Biology of the Leaf Miners" (Dr. W. Junk, 's-Gravenhage, Netherlands, 1951) illustrates the adult, larva and blotch mine of a related species *Trachys minuta* L., that mines the leaves of *Salix, Ulmus, Tilia* and occurs on Rosaceae and Amentiferae. Another foreign species *Trachys troglodytes* Gyllh., mines the Dipsaceae: *Succisa, Knautia* and *Scabiosa.*

It is not known how long *Trachys pygmaea* (Fab.) had been in this country before its discovery by Dr. Linsley in Rutherford, N. J., in 1948. It is not unexpected to find introduced species in the Rutherford area of New Jersey, considering the enormous amounts of nursery stock that were brought into that area from foreign countries many years ago by several large nurseries. In view of the great popularity of hollyhock (*Althæa rosea*) as a garden plant it is expected that in years to come *T. pygmaea* (Fab.) will be as widely distributed as its host. It may already occur in states adjoining New Jersey.

The Nomenclatural Status of the Fire-Brat

Last year I [1] drew attention to the fact that the fire-brat (Thysanura, Lepismatidae) had originally been described under the name *Lepismodes inquilinus* Newman and that this should therefore take precedence over *Thermobia domestica* (Pack.), the name at that time in common usage. However, in view of the frequency with which the latter name has appeared in the literature over the past fifty years and on account of the inadequacy of Newman's original description, application has been made to the International Commission on Zoological Nomenclature to place the name *Thermobia domestica* on the Official List of Specific names in Zoology, the names *Lepismodes inquilinus* and *Thermobia furnorum* (Rovelli) on the Official Index of Rejected and Invalid Specific Names in Zoology and the name *Lepismodes* on the Official Index of Rejected Generic Names. It is suggested that whilst this matter is receiving the consideration of the Commission the name *Thermobia domestica* should be used.—M. J. DELANY, Univ. of Florida, Gainesville.

[1] DELANY, M. J. 1953. A revision of the British Thysanura. Ent. mon. Mag., 89: 144–145.

Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

Disinsectization. "Disinsectization" and "disinsectize" have appeared recently upon the entomological horizon, blossoming forth in printed administrative instructions issued by the Plant Pest Control Branch of the Agricultural Research Service of the United States Department of Agriculture. These words seem strange to the eye and sound strange to the ear but it is not strange to find them coming from Washington.

Everyone, of course, has a perfect right to manufacture transitive and intransitive verbs by adding the suffix "ize" and to form nouns from verbs by adding the compound suffix "ization," and also to use the prefix "dis" to convey the meaning of undoing or reversal.

In order for something to be disinsectized it first has to be insectized, and in order for it to be disinsectized properly, there has to be a method of disinsectization. If one's property is infested by ants, it is then said to be antized. To correct this situation it should be disantized by a method of disantization. Extending the principle to ticks, we have tickize, distickize and distickization. For roaches we can have roachize, disroachize and disroachization, for grubs, grubize, disgrubize and disgrubization. The possibilities are endless.

Some of the monstrosities made by tinkering with suffixes and prefixes are not generally adopted and have a short life, but others remain in use for years. Most new verbs seem to be made by advertising men and newspaper writers. Although the past never stays put and one expects vocabularies to be constantly extended, it is hoped that such irritating words as disinsectization and others of like ilk are not the beginnings of entomological gobbledygook which we can very well do without.—HARRY B. WEISS.

Current Entomological Literature

Compiled by VENIA T. PHILLIPS, Librarian

Academy of Natural Sciences of Philadelphia

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania pertaining to entomology, including all arthropods except Crustacea. Coverage will be world-wide as regards major contributions to systematics as well as for all papers on morphology, physiology, embryology, etc. In addition, for species from the Americas and the Pacific (Nearctic, Neotropical and Polynesian regions) all minor contributions to taxonomy, distribution, etc., will also be recorded.

This list gives references of the year 1954 unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For other records of general literature and for economic literature, see the Bibliography of Agriculture, Washington, and the Review of Applied Entomology, Series A, London. For records of papers on medical entomology see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of periodicals and serials published in our January and June issues. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Angus, T. A.—Use of methyl cellulose in laboratory tests of bacterial pathogens of insects. [43] 86: 206. **Born, D. E.**—Mold control in fly rearing media. [76] 47: 367. **Burris, W. E.**—The bottom fauna development of a newly constructed pond in Central Oklahoma. [Okla. Acad. Sci., Proc.] 33: 129–36, ill., 1952 (publ. in 1954). **Burton, G. J.**—Rapid permanent mounts of mosquito larvae with creosote-alcohol, phenol-alcohol, lactophenol and polyvinyl alcohol. [92] 14: 72–75. **Callan, E. McC.**—Insects and a mite associated with Gerbera Jamesoni Bolus in Trinidad. [60] 90: 112. **Carter, W.**—The insect and the plant disease. [76] 47: 210–15. **Carthy, J. D.**—The rôle of vision in route-finding in insects. [Advance. of Sci.] 11: 75–78. **Crisp, G. & L. Lloyd.**—The community of insects in a patch of woodland mud. [126] 105: 269–314, ill. **Glen, R.**—Factors that affect insect abundance. [76] 47: 398–405. **Horen, W. P.**—Modified flag for tick collecting. [111] 30: p. 112. **Kerr, R. W.**—A method for the topical application of small measured doses of insecticide solutions to individual insects. [40] 45: 317–21, ill. **Kitzmiller, J. B. & D. W. Micks**—Techniques for rearing Culex mosquitoes. [12] 52: 253–56. **Langston, R. L.**—Technique for mass rearing of Harrisina brillians (Zygaenidae). [85] 8: 11–12. **Long, D. B.**—Some problems of polymorphism in insects. [124] 27: 99–110, 1952. **Michener, C. D.**—Problems in the development of social behavior and communication among insects. [81] 56: 1–15, 1953.

Popham, E. J.—A new and simple method of demonstrating the physical gill of aquatic insects. [124] 29: 51–54, ill. **Smith, R. F.**—The importance of the microenvironment in insect ecology. [76] 47: 205–10. **Stuardo O., C.**—Los atlas de la historia fisica y politica de Chile. [Rev. Chilena Ent.] 3: 152–78, 1953 (publ. in 1954).

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Reviews

AN INTRODUCTION TO THE STUDY OF INSECTS by Donald J. Borror and Dwight M. DeLong (The Ohio State University). Pp. ix + 1030; over 600 illustrations. Rhinehart and Company, New York, 1954. $9.00.

This book provides keys to all the insect families in the United States, with the exception of some of the beetles. Numerous line drawings illustrate the characters used in the keys and there are many habitus pictures as well, and a complete glossary. For each family there is a short paragraph, usually of a few lines to half a page or more, that tells something of the habits of the insects and of their importance.

In size and general make-up this book resembles Essig's "College Entomology" (Macmillan, 1942). It, too, has only a short chapter of 52 pages on anatomy and metamorphosis and then concerns itself with the classification into orders and families. In addition, and not found in Professor Essig's book, the concluding 184 pages deal with: Relations to man, control, collecting and preserving, activities and projects (electric questioners, cages, rearing, photography), and a list of experiment stations and entomological societies. Continuing the comparison, we may say that the Essig book offered more information on the various insect groups, using more text material (about 20% more per page by closer spacing of the lines) and giving less space to illustrations. In the present volume much space is wasted by illustrations that are frequently excessively large in relation to the detail they are to show, and by the way they are arranged. And if we draw our "Comstock" into the com-

parison we may then see how much entomology can really be packed into approximately 1000 pages!

These comparisons are intended to help describe the book, not as a criticism. It is, evidently, a practical book for actual use in learning the distinguishing features of the orders and families by means of the keys and a study of the figures, rather than merely a reference book. Especially gratifying is the fact that *all* American families are said to be included in the keys, with the exception of some of the rare or minute families of beetles that are listed but marked as not keyed. However, there is an orthopteran family (Eumastacidae) that has escaped mention entirely. The fact that this book avoids giving too much information not pertinent to its primary aim is in keeping with the times, and the so prevalent student resistance to the more fundamental or theoretical aspects of a subject.

The reviewer would not favor a beginning course in entomology based mainly upon the identification of insects. In chemistry, one begins with "general chemistry," not with qualitative analysis; in zoology with a course in "general zoology." Why not, in fairness to our science and to the student, begin entomology with a broad, general course?—R. G. SCHMIEDER.

BRUES, CHARLES T., AXEL L. MELANDER and FRANK M. CARPENTER. 1954. Classification of Insects, Keys to the Living and Extinct Families of Insects, and to the Living Families of other Terrestrial Arthropods. Bull. Mus. Comp. Zool. Harvard College 108: 1–917. $9.00.

The present edition of this widely known and useful work differs from the preceding one only slightly, chiefly in being longer (917 vs. 672 pages) and in containing a section devoted to fossil insects. The format has not changed at all and the illustrations (line drawings of key characters) are the same as in the 1932 edition, even bearing the same numbers. However, there are added to these about 100 figures in the keys to the extinct orders and families.

Part I contains keys to the families of 27 orders of insects—seven less than previously dealt with, the difference being accounted for by a reduction in rank to subordinal status for the Grylloblatodea, Phasmatodea, Mantodea, Diploglossata, Homoptera, Megaloptera and Raphidiodea. A key to the classes of living Arthropods lists twelve, an increase of one, due to the addition of the tongue worms (Pentastomida), here elevated from ordinal rank. Part II, with keys to the families of ter-

restrial Arthropods other than insects has changed so little that no comment is necessary.

The extinct families of insects are treated in the third, and new, part of the work which also provides a key to the extinct orders (44 listed, of which ten are considered valid). These keys are not intended for use in classifying insect fossils, but merely to indicate taxonomic differences of the forms involved and to illustrate current classification. Included in this section is a chronological list of the extinct orders, a table of the geologic periods and a conspectus of the extinct families. Each order and family has its range in time indicated in the key.

The glossary of technical terms, index to genera and higher categories, and one to common names, are retained. Following each key is a list of selected references of monographic or equivalent scope, which remains one of the most useful parts of the work. In this edition these total about 8000 entries as opposed to the 4000 and some odd previously noted.

Some criticism might be leveled by specialists disagreeing with the systematic treatment of their own groups (as, why are the Eumastacids accorded only a subfamilial rank when the Tetrigids are treated as a family? [Orthoptera]), but on the whole the treatment is logical and conservative. Less logical is the presentation of a key to the larvae of the Hymenopterous insects in which one half of the forms are separated by morphological characters while the others are split off by ethological or ecological ones, when in the latter case perfectly distinct morphological characters are known (from the works of Grandi, Richter, Reid, Soika, G. C. Wheeler, etc.). Some important omissions may be noted in the references, e.g., Muma, M. H. 1951. The Arachnid order Solpugida in the United States. Bull. Amer. Mus. Nat. Hist., 97 (2): 35–141, from the references listed behind the key to the families of that order.

As a basic reference for students of systematic entomology the work remains unsurpassed.—HAROLD J. GRANT, JR.

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